

PATENT COOPERATION TREATY

PCT

REC'D 27 FEB 2006

WIPO

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)



Applicant's or agent's file reference 2802-118-005	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US2005/003842	International filing date (<i>day/month/year</i>) 08.02.2005	Priority date (<i>day/month/year</i>) 24.02.2004
International Patent Classification (IPC) or both national classification and IPC G05D16/20		
Applicant PARKER-HANNIFIN CORPORATION ET AL.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

 These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:
 - I ☒ Basis of the opinion
 - II ☐ Priority
 - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application

Date of submission of the demand 08.09.2005	Date of completion of this report 28.02.2006
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer Goetz, P Telephone No. +31 70 340-2556 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/US2005/003842

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-13 as originally filed

Claims, Numbers

1-21 as originally filed

Drawings, Sheets

1/5-5/5 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/US2005/003842**

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-21
	No: Claims	
Inventive step (IS)	Yes: Claims	
	No: Claims	1-21
Industrial applicability (IA)	Yes: Claims	1-21
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item V.

1 Reference is made to the following documents:

D1 : US 2002/092573 A1 (HARMS LOUIS C ET AL) 18 July 2002 (2002-07-18)
D2 : US 4 741 364 A (STOSS ET AL) 3 May 1988 (1988-05-03)

2 INDEPENDENT CLAIM 1

2.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject matter of claim 1 does not involve an inventive step in the sense of Article 33(3)PCT.

2.1.1 Document D1, which is considered to represent the most relevant state of the art to the subject matter of claim 1, discloses (the references in parentheses applying to this document) a proportional pressure control valve (20) comprising a cage (42) which extends in an axial direction and in a radial direction and includes a wall having an inner surface and an outer surface which define a thickness dimension therebetween, and the wall having formed therethrough a pump port opening (56) in fluid communication with a pump port (84) of the system for receiving fluid under pressure, a clutch port opening (54) in fluid communication with a clutch port (34) of the system for supplying such fluid to an actuator, and a tank port opening (52) in fluid communication with a tank port (32) of the system for returning such fluid to a tank; a spool (112) received within the cage to be moveable axially relative to the cage for controlling fluid flow between the clutch port opening (54) and the pump port (56) and tank port (52) openings, the spool having a feedback pressure surface (114) responsive to an applied feedback fluid pressure urging the spool to move axially relative to the cage in a first direction towards a first position allowing fluid flow between the clutch and the tank port, a feedback chamber (118) defined within the cage for developing the feedback fluid pressure on the feedback pressure surface (114) of the spool; and a clutch port pressure feedback passage (126) coupling the clutch port in fluid communication with the feedback pressure chamber (118) for admitting a fluid flow from the clutch port into the feedback pressure chamber to develop the feedback fluid pressure on the feedback pressure

surface on the spool.

- 2.1.2 The subject-matter of independent claim 1 differs from the disclosure of D1 in that the clutch port pressure feedback passage is formed within the thickness dimension of the cage wall and extends generally axially intermediate a first port in fluid communication with the control pressure chamber and a second port in fluid communication with the clutch port of the system.
- 2.1.3 The problem to be solved by the present invention may therefore be regarded as how to improve the fluid communication between the clutch port and the feedback chamber.
- 2.1.4 In view of D2 the solution proposed in claim 1 of the present application cannot be considered as involving an inventive step (Article 33(3) PCT) for the following reasons: In document D2 it is disclosed that an axial passage **within the wall** of the cage (pilot feedback passage 52) can be used for establishing a communication between an outlet port 24 and a feedback pressure chamber 162, distant from said port, whereby as in document D1, said feedback chamber is located beyond a second port of the valve. The skilled person, implementing the valve of document D1, would in order to improve the communication between the clutch port and the feedback chamber consider as a normal option to incorporate the teaching of document D2 concerning the connection of the load channel with a feedback chamber and arrange an axial passage into the cage wall as disclosed in document D2.
- 2.1.5 Therefore the features disclosed in D1 and D2 would be combined by the skilled person, without exercise of any inventive skills in order to solve the problem posed. The proposed solution in independent claim 1 thus cannot be considered inventive (Article 33(3) PCT).

3 INDEPENDENT CLAIMS 8 and 15

- 3.1 Independent claim 8 and 15 concern a valve and a control method comprising only features which correspond to the features defined in independent claim 1. For

essentially the same reasons as given in relation with claim 1 in paragraph 2 of the present opinion, it appears that the subject matter of claims 8 and 15 does not involve an inventive step in the sense of Article 33(3)PCT.

4. DEPENDENT CLAIMS 2-7, 9-14, 16-21

- 4.1 Dependent claims 2-7, 9-14, 16-21 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step (Article 33(2) and (3) PCT). Document D1 discloses the use of a control pressure surface, the use of a pilot valve and the use of a restriction orifice in the feedback passage. Document D2 discloses the use of radial passages in combination with the axial feedback passage. The combination of document D1 and document D2 would thus disclose the additional features of the dependent claims of the present application.